BARBIERI

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with
ISO 14025:2006 y EN 15804:2012

Programme:
International EPD® System

Programme operator:
EPD Internacional AB

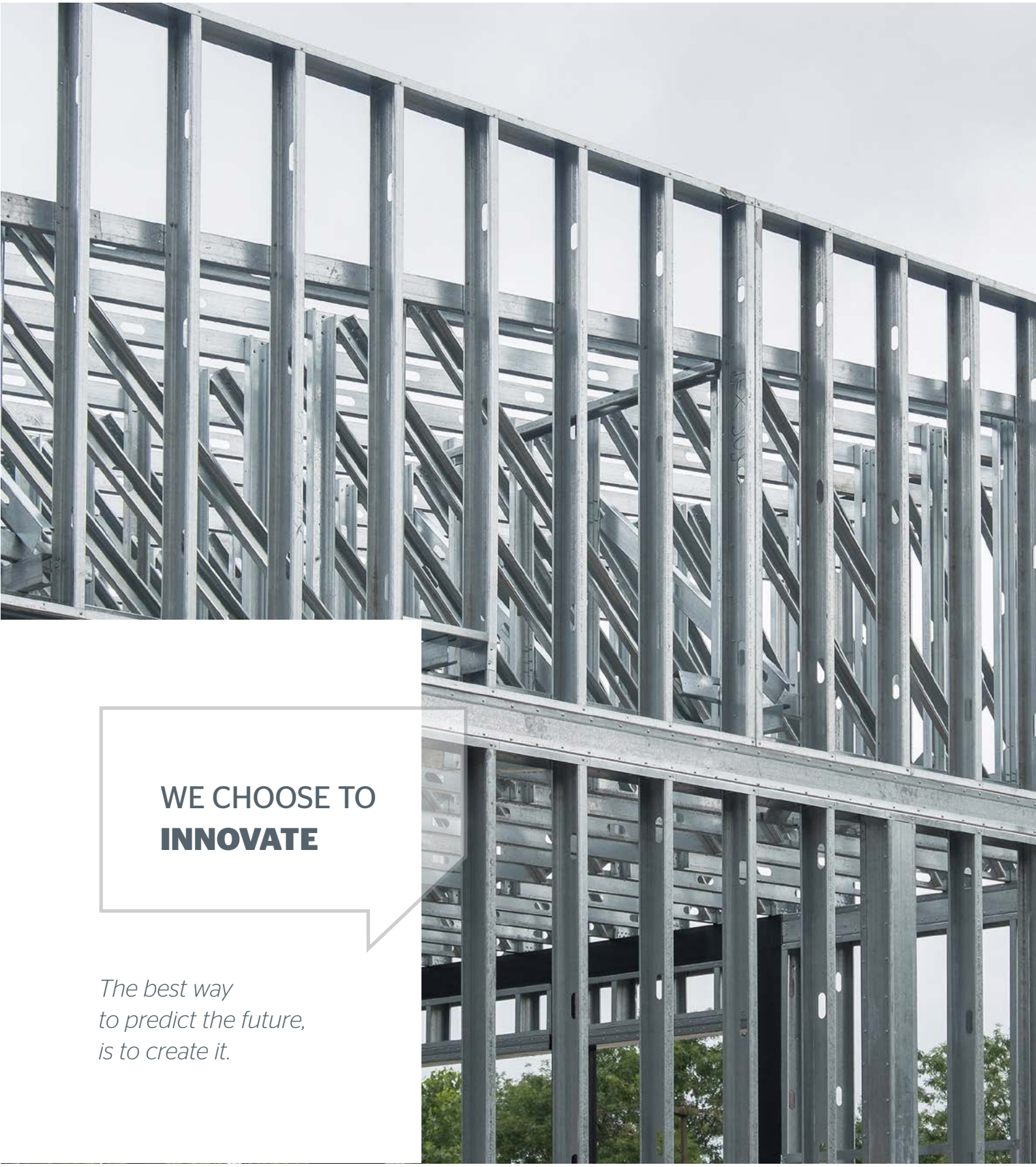
EPD Registration number:
S-P-05012

Issuance date:
30/10/2021

Validity date:
29/10/2026

Galvanized steel profiles
Steel Frame®

manufactured by A.D. Barbieri S.A. Argentina



WE CHOOSE TO **INNOVATE**

The best way
to predict the future,
is to create it.

1 - EPD content

2 - Barbieri

Barbieri is a global, family business founded in 1953 in Argentina by Arduín Darío Barbieri, national referent as regards Corporate Social Responsibility activities. This led to having people's lives improvement and building a brighter future and a better world as inherent goals for the company.

Throughout the years, Barbieri became a **leader in high-quality solution construction with cutting edge technology within the dry construction industry.**

The company's main brands are Steel Frame®, galvanized steel profiles, whose dry assembly allows for the building of dwellings, interstories, outdoors enclosures, and industrial ships among other things, and **Drywall Plus®**, galvanized steel profiles used to build non-load bearing partitions, ceilings, and linings coatings in dwellings and/or shops.

Barbieri has manufacturing plants in Argentina, Brazil, Uruguay and Paraguay and it provides its innovative solutions to different parts of many places in the world.
The Company has over 180 employees in Argentina and it reaches 250 employees when its regional business is considered.

Barbieri offers a value chain association for comprehensive growth while providing solution construction and technical assistance to develop effective work. It also offers broad theoretical and practical training about the constructive system aimed at achieving social inclusion and creating growth and development opportunities.

In addition, Barbieri has Consul Steel, an exclusive consulting firm for Steel Frame, working towards an easier transition from wet systems to dry, more sustainable systems. This is done specifically by providing training and comprehensive technical assistance throughout the whole construction process.

OUR
GOAL

Build future
Build a family

Today, we are still committed to our goal to "**Build Future, Build a Family"** through a new sustainable corporate paradigm and with lasting, cooperative bonds.

OUR MISSION

Redefining the meaning of work in our value chain creating opportunities that encourage us to grow together.

Our guiding values are:

- **Integration:** we build a big family together.
- **Commitment:** we all cooperate with our goals.
- **Passion:** We love what we do, and so we keep on dreaming.
- **Honesty:** Trust is our management policy.
- **Sustainability:** We are innovative towards triple impact.

These are the basis on which we design our triple impact strategy, always in line with our business core, sustainable construction. We make sure to be mainstream by addressing economic, social, and environmental matters through their 4 supporting pivots:

- *Welfare:* we want that every member of the Company be able to grow personally and professionally and we are committed to that wish.
- *Responsible production:* we are committed to be innovative and to continuously offer sustainable consumption and production methods.
- *Community:* through innovation, strategic partnerships, and education, we seek to change the construction industry and to foster a sustainable construction system.
- *Sustainability Leadership:* we aim to lead the change towards a triple-impact-based paradigm through internal cultural evolution and by prompting other actors to rethink their own businesses.

Moreover, and in line with our strategy we undertook the commitment of being part of the 2030 Agenda thus **contributing to the SDGs we deem to be strategic.**

3 - General information

Products	PGC 90 x 0,9; PGC 100 x 0,9; PGC 150 x 1,25; PGC 200 x 1,6; PGC 250 x 2,5; PGC 300 x 2,5; PGU 90 x 0,9; PGU 100 x 0,9; PGU 150 x 1,25; PGU 200 x 1,6; PGU 250 x 2,5; PGU 300 x 2,5; PGO 37 x 0,9. All manufactured and certified by IRAM-INTI according to standard IRAM IAS U 500-205 Parts 1, 2, 3 and 4.
EPD owner)	A.D. Barbieri S.A.
LCA Author	IMPAQTING
Description of the construction product	Structural Galvanized steel profiles for dry construction, belonging to the Steel Frame® product family from AD Barbieri S.A. These products are used for the bearing structure of houses, facades and mezzanines (among other uses).
Declared unit	1 metric ton of each profile.
Identification of cosntruction product	Identification of construction product Central Product Classification: CPC 41266 angles, shapes and sections, of alloy steel.
Scope of the declaration	This EPD is based on production data belonging to the period between April 2018 and March 2019, and covers the modules A1 to C4, plus Module D (cradle to gate with options).
Site for which this EPD is representative	AD Barbieri S.A. manufacturing plant, located at: Luis M. Drago 1382, Almirante Brown, Buenos Aires Province, Argentina.
Intended use of EPD	Communicate information about the potential environmental impacts of the products under study in a transparent way, based on Life Cycle Assessment methodology (LCA).
For more information, refer to	adbarbieri.com
LCA Report issue date	04/10/2021
EPD issuance date	30/10/2021
EPD validity date	29/10/2026
Identification of used PCR	2012:01 Construction products and construction services Version 2.31

The EPD owner has the sole ownership, liability, and responsibility for the EPD.
EPDs of construction products may not be comparable if they do not comply with EN 15804. EPDs within the same product category but from different programmes may not be comparable.

4 - Product description

Steel Frame® dry construction systems are composed of a variety of Galvanized steel bearing profiles, used to build dwellings, mezzanines, exterior enclosures and industrial buildings (among other uses). They are certified under standard IRAM-IAS U 500-205, with IRAM INTI DC-M-B21-002.1 certificate, thus guaranteeing the sheet thickness, the required measures and all other requirements established by the mentioned Standard.
The galvanized steel sheets used as raw material for the profiles have a Z 275 zinc coating, with 275 gr/m² of zinc on both sides, TST.
The characteristics of each of the galvanized steel profiles that are included in this EPD are presented below.
According to standard IRAM IAS U 500-205, in each case, the thickness of the base sheet is provided, without including the galvanized coating thickness, which is 0,04 mm.

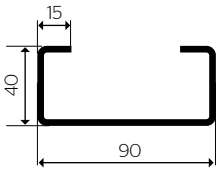
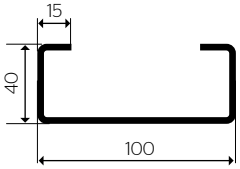
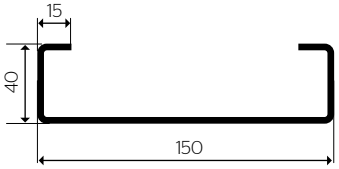
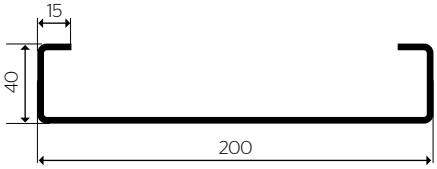
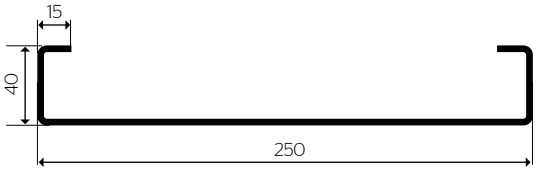
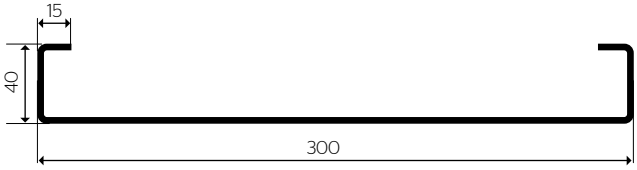
PRODUCT	SHEET THICKNESS (without zinc cover)	SECTION
PGC 90	0,9 mm	
PGC 100	0,9 mm	
PGC 150	1,25 mm	
PGC 200	1,6 mm	
PGC 250	2,5 mm	
PGC 300	2,5 mm	

Table 1 – Sheet thickness and section per product

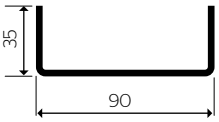
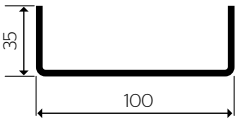
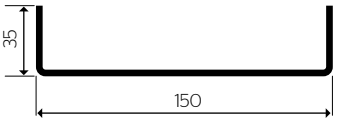
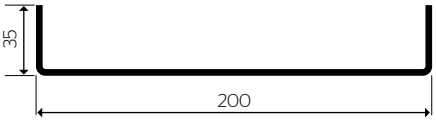
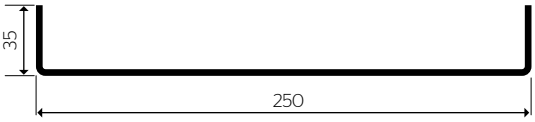
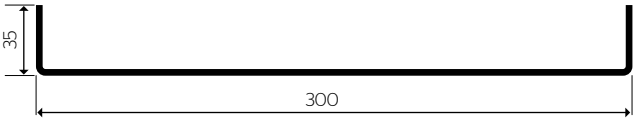
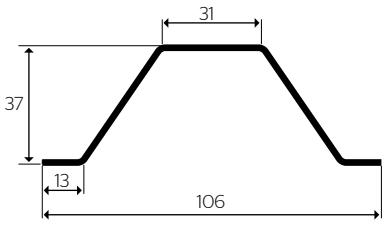
PRODUCT	SHEET THICKNESS (without zinc cover)	SECTION
PGU 90	0,9 mm	
PGU 100	0,9 mm	
PGU 150	1,25 mm	
PGU 200	1,6 mm	
PGU 250	2,5 mm	
PGU 300	2,5 mm	
PGO 37	0,9 mm	

Table 1 – Sheet thickness and section per product

5 - Content declaration

All products under this EPD use the same hot-dip Galvanized steel as the only raw material. Therefore, the content declaration is the same for every product.

UNIFORM MATERIAL OR CHEMICAL SUBSTANCE	FUNTION	WEIGTH
Low-alloyed steel	Structura	> 94%
Zinc	Coating agent	< 5%
Chemical treatment	Adherence of coating agent	< 1%

Table 2 – Typical composition of galvanized steel used for the profiles

The products do not contain any hazardous substances listed in the "Candidate List of Substances of Very High Concern" (SVHC) [1] for authorization under the REACH regulation, in a percentage higher than 0,1% of the product weight.

[1] https://echa.europa.eu/es/candidate-list-table

WE CHOOSE
QUALITY

At Barbieri we do not control quality,
we manufacture it.

6 - LCA calculation information

Potential environmental impacts were calculated:
- According to EN 15804:2012+A1:2013 and PCR 2012:01 Construction products and construction services V2.31.
- Using Life Cycle Assessment (LCA) methodology, according to ISO 14040:2006 and ISO 14044:20016.
An external third-party verification process of the EPD was conducted according to General Programme Instructions for the International EPD® System Version 3.01. Verification includes a documental review and a validation of both the underlying LCA study and documents describing additional environmental information that justify data provided in the EPD.
This EPD is in accordance with ISO 14025:2006.

6.1 - Declared unit

One metric ton of galvanized steel profile.

6.2 - System boundary

This EPD is a “cradle to gate with options” EPD, according to EN 15804:2012+A1:2013 and PCR 2012:01 Construction products and construction services V2.31.

LIFE CYCLE ENVIRONMENTAL INFORMATION OF GALVANIZED STEEL PROFILES																OTHER ENVIRONMENTAL INFORMATION
A1 - A3			A4 - A5		B1 - B7							C1 - C4				D
Product stage			Cosntrution process stage		Use stage							End of life stage				Resource recovery stage
raw materials	transport	manufacturing	transport	cosntruction intallation	use	maintenance	repair	replacement	refurbishment	operational energy use	operational water use	deconstruction, demolition	transport	waste processing	disposal	reuse, recovery, reciclyng potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3 – System boundary. X = included in the LCA

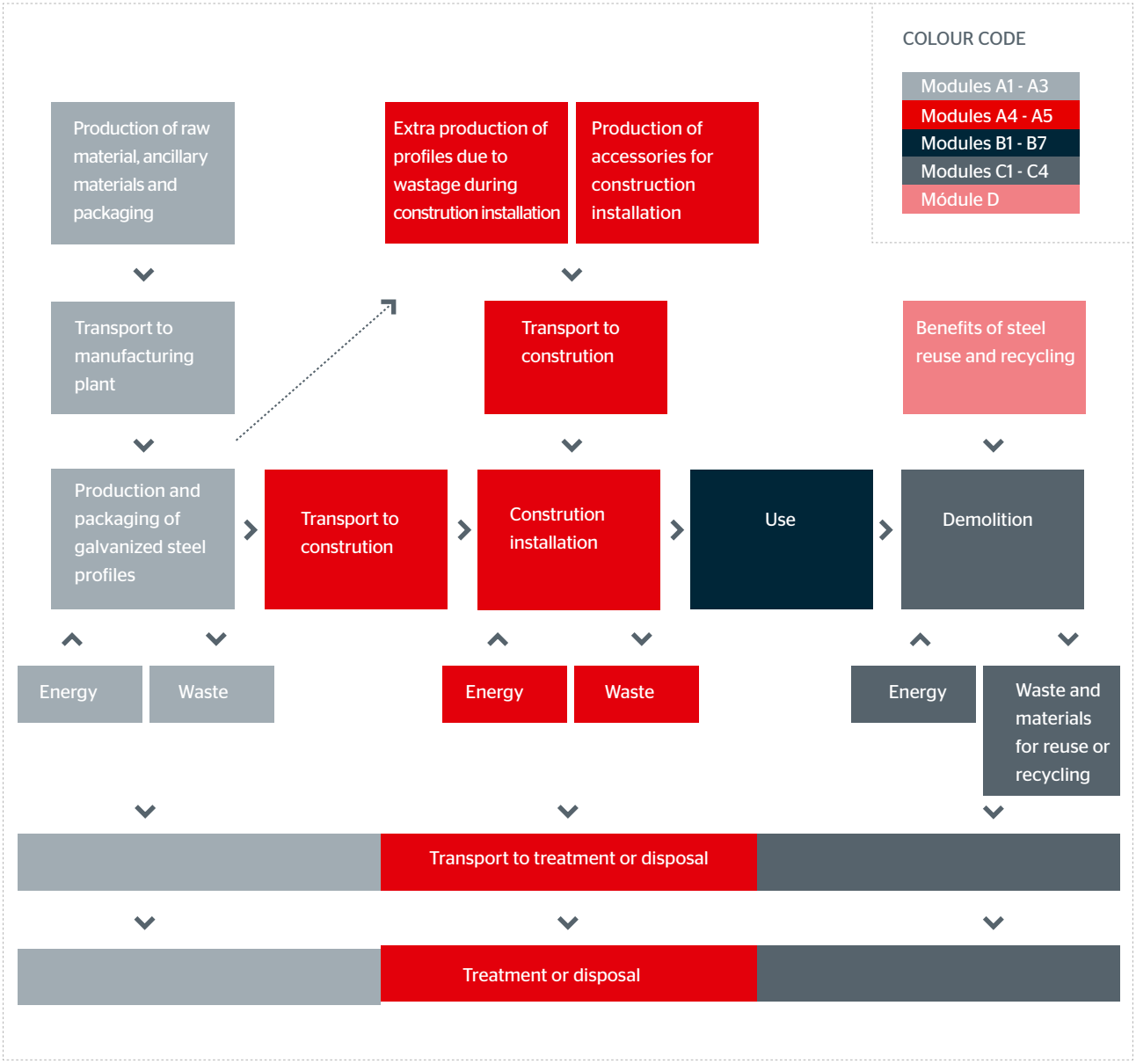


Figure 1 – System boundary with inputs and outputs

6.3 - Reference service life

50 years of service life is considered for the products.

6.4 - Cut-off criteria

As established in EN 15804:2012+A1:2013, a minimum of 99% of energy and mass flows of each unit process are included.

The following were kept out of the scope of the study:
- Environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process.
- Personnel-related environmental impacts, such as transportation to and from work.

6.5 -Allocation

Allocation of inputs and outputs between product and by-product was based on mass, considering the quantity produced per year of each product and byproduct at the level of unit process.
Steel scrap generated during the manufacturing process in AD Barbieri S.A. was considered a by-product for allocation purposes since it represents economic income for the company. Steel scrap is the only by-product produced at the manufacturing facilities.

6.6 - Geographical and temporal coverage

Primary data was collected for AD Barbieri S.A.'s manufacturing plant, located in Argentina and for fiscal year 2018, which includes the period from April 1st, 2018 to March 31st, 2019.

6.7 - Description of the manufacturing process

Initially, the purchased hot-dip Galvanized steel coils are divided into narrower bands (longitudinal cut). Then, the steel profiles are manufactured through cold roll forming.
It is important to highlight that the galvanized steel coils used by AD Barbieri S.A. are manufactured by an external company through the Blast Furnace – Basic Oxygen Furnace (BF-BOF) route.

The following figure illustrates the production stages in the AD Barbieri S.A. manufacturing plant.

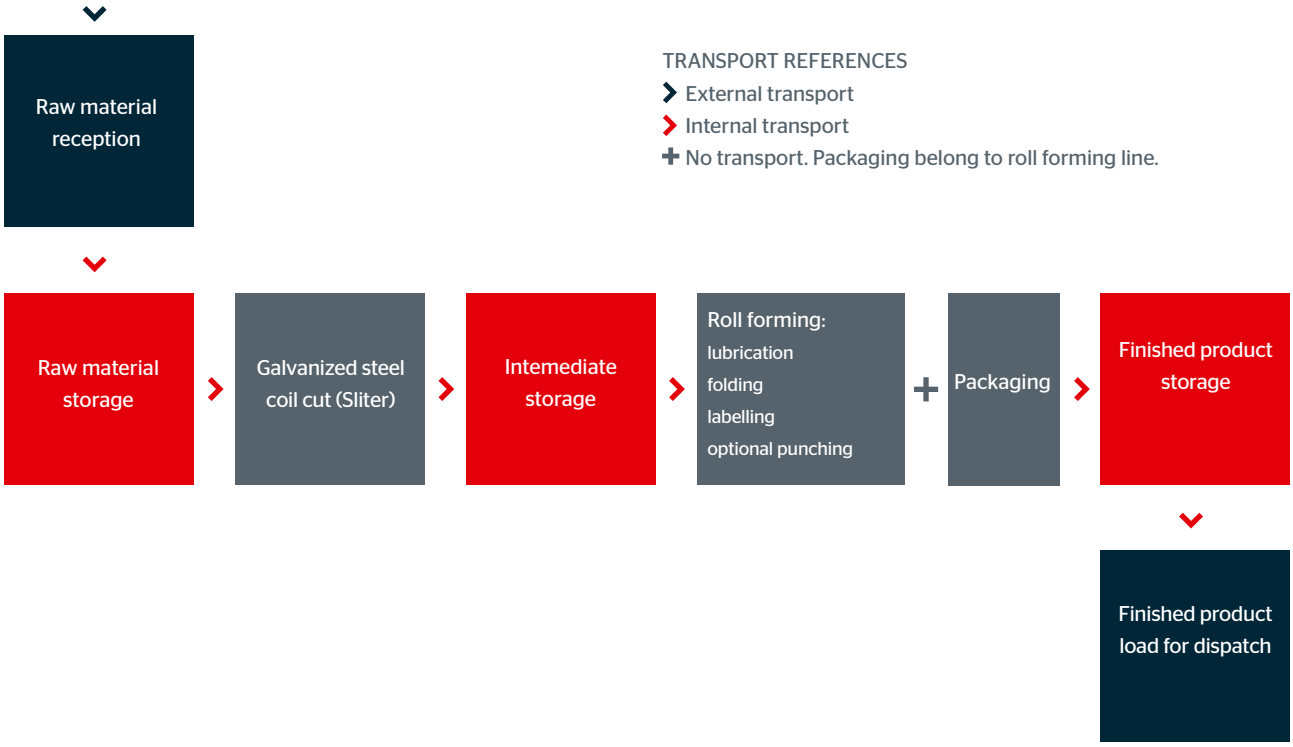


Figure 2 – Flow diagram of manufacturing process

6.8 - Description of the information and modules included in this epd

6.8.1 PRODUCT STAGE

This stage includes the raw material and energy supply, as well as transportation and production of the products. Galvanized steel is the only raw material consumed in the production of the products and it is purchased from an external supplier.

6.8.1.1 A1 - Raw materials supply

This module includes the extraction and processing of raw materials and power used in the manufacturing process. Particularly, it includes:

- *Extraction and processing of raw material:* production of galvanized steel via the BF-BOF production route.
- *Generation and distribution of electricity:* electricity consumption by Slitter machine (longitudinal cut of steel coils), by the cold roll-forming process, by the air compressor and for internal transport.

6.8.1.2 A2 - Transportation to the manufacturing plant

This module includes the transportation from the tier 1 supplier to AD Barbieri S.A.'s manufacturing plant, of the following materials:
- *Raw material:* galvanized steel.
- *Finished product packaging:* metallic bands.
- *Ancillary materials:* hydraulic oil, cleaning degreaser, cleaning cloths, lubricants, finished product printing ink, finished product printer cleaner.

Additionally, this module includes the internal transportation within AD Barbieri S.A.'s manufacturing plant that is done using a forklift and using a bridge crane.

6.8.1.3 A3 - Manufacturing

This module includes the inputs and outputs that are consumed/generated due to the manufacturing process in AD Barbieri SA's plant, that were not contemplated in modules A1 and A2. Particularly, it includes:
- *Production of ancillary materials.*
- *Production of finished products' packaging.*
- *Transportation of waste generated from the manufacturing plant to the treatment and/or disposal site.*
- *Treatment and/or disposal of waste, until they reach the end-of-waste state.*

6.8.2 CONSTRUCTION PROCESS STAGE

6.8.2.1 A4 - Transportation to the construction site

This module includes the transportation from the production gate to the construction site, and it is calculated based on a scenario, using the parameters described in the following table.

PARAMETER	VALUE - DESCRIPTION
Vehicle type, load capacity, fuel type	Truck, 27 ton, Diesel
Distance to construction site	204,15 km
Capacity utilization, including empty returns	80% capacity utilization 51% empty returns
Apparent density of transported products	7850 kg/m³
Volume capacity utilization factor	1

Table 4 – Transport to the construction site scenario

6.8.2.2 A5 - Construction installation

The following construction installation scenario is considered:
- Installation of products in 6 representative dwellings.
- Steel Frame products under study are used for friezes, outside and inside walls, lintels, mezzanines, and coverages.

This module is calculated according to the parameters shown in the following table.

PARAMETRE	VALUE - DESCRIPTION
Ancillary materials for installation	Galvanized steel accessories are consumed (installation accessories such as screws, joints, and washers), as well as nylon dowels.
Water use	No water is used.
Other resources use	No other resources are used.
Quantitative description of energy type and consumption during the preparation and installation process	Electricity is used for the powerdrivers, grinding machines, and circular saw.
Waste materials on the building site, before waste processing, generated by the product's installation; specified by type	Waste of steel profiles: 4% Waste of steel and nylon accessories: 1%
Output materials (specified by type) as a result of waste processing at the construction site e.g. of collection for recycling, for energy recovery, disposal; specified by type	Waste of steel profiles: to landfill.
	Waste of steel and nylon accessories: to landfill.
	Packaging waste (metallic bands): to landfill.
Direct emissions to ambient air, soil and water	No emissions are generated.
Transport of ancillary materials to construction site: type of vehicle	Truck, 27ton, Diesel.
Transport of ancillary materials to construction site: type of vehicle	204,15 km
Transportation of waste materials to landfill: type of vehicle	Dump truck of 10m³ capacity.
Transportation of waste materials to landfill: distance	25km.

Table 5 – Construction installation scenario

6.8.3 USE STAGE

The use stage includes the following modules:
- B1: Use
- B2: Maintenance
- B3: Repairment
- B4: Replacement
- B5: Refurbishment
- B6: Operating power use
- B7: Operational water use

The products under study do not require technical operations during the use stage. Therefore, the steel profiles do not generate any impact in this stage.

6.8.4 END OF LIFE STAGE

This stage includes the modules described in the following sections, and is calculated based on a scenario using the parameters described in Table 6 - End of life scenario.

6.8.4.1 C1 - Deconstruction, demolition

During the demolition of the construction, the dismantling of the profiles takes place. For the products under study, electrical power is used since the profiles have to be unscrewed.

Waste materials (profiles and certain steel accessories that can be recycled, such as screws) are collected separately from other construction waste so that they can be reused or recycled. Nylon dowels and other steel accessories that cannot be recycled (since they embedded in the concrete) are collected together with other mixed waste construction materials, for their transportation to landfill.

It is considered that 70% of the profiles are reused in other construction sites, as they remain in good condition after the demolition, and it is considered that the remaining 30% of the profiles are recycled, for having suffered significant deformations during the demolition. It is considered that 100% of the steel accessories that can be recycled, are recycled.

6.8.4.2 C2 - Transportation of waste to treatment

Depending on the material, it is taken to landfill, recycling or reuse.

For the transportation of accessories that are allotted to landfill, the considerations taken are the same as those described in module A5. These accessories constitute the only waste generated in the demolition, and are transported in a dump truck to a landfill, where its final disposal is carried out.

For the transportation of 30% of the profiles that are intended for recycling and for the transportation of the accessories that are recycled, the same transportation distance of materials to construction installation is considered, specified in module A4 (204km).

For the transportation of the remaining 70% of the profiles that are reused in another construction site, a distance of 25km is taken, considering that the reuse is carried out in areas close to the building being demolished.

6.8.4.3 C3 - Waste processing

In the case of materials that are sent to recycling, the pre-recycling processing consists of separating the materials, so that they can then be effectively recycled. The impacts generated in this processing stage are considered negligible.
In the case of materials that are aimed for reuse, no processing is carried out prior reusing them in another construction site, so the environmental impact is considered to be zero.

6.8.4.4 C4 - Disposal

At this stage, only non-recyclable accessories that are intended for landfill when demolishing the work are considered.

PARAMETRE	VALUE - DESCRIPTION
Collection process specified by type	Waste profiles are collected separately from other construction waste.
	Steel accessories' waste that are recycled (screws, traction jacks, threaded rods, double joints, SA angles, and washers) are collected separately from other construction waste.
	Nylon dowels and other steel accessories destined for landfill (threaded rods, expansion anchor) are collected along with other mixed construction waste.
Recovery system specified by type	Recycling: It is considered that 30% of the profiles are recycled, as they cannot be reused for having been deformed during the demolition.
	Reuse: it is considered that 70% of the steel profiles are reused in another construction site.
	Recycling: certain steel accessories are recycled.
Disposal, specified by type	Nylon dowels and certain steel accessories that are not recycled are sent to landfill.
Assumptions for scenario development: transport type	Dump truck of 10m³ of capacity.
Assumptions for scenario development: transport distance	Distance to landfill – 25km
	Distance to recycling – 204km
	Distance to reuse in other construction site – 25km

Table 6 – End of life scenario

6.8.5 MODULE D: FUTURE REUSE, RECYCLING OR ENERGY RECOVERY POTENTIALS

This module reflects the environmental benefits of reusing or recycling steel from the demolition stage.
It should be noted that the results obtained for module D cannot be discounted from the potential environmental impact results calculated for the other modules.
The percentages of reclycling and reuse were modelled according to expert judgment.

In the case of the reutilization of profiles in another construction site, credit is given to the system considering that the reuse decreases the demand for galvanized steel (manufactured by the blast furnace and LD converter) of the next building that uses the profiles.
In the case of the recycling of steel profiles and accessories, credit is given to the system for the net scrap that is produced at the end of the life of the mentioned products. The value of the credit was calculated following the methodology developed by the World Steel Association [2], which is based on the difference between a theoretical production of 100% primary steel (blast furnace route and LD converter) and 100% secondary steel (electric arc furnace route). The environmental indicators for each production route are obtained from the Ecoinvent 3.6 database, as implemented in SimaPro 9.1.

The World Steel Association methodology considers:
• That steel is recycled in a "closed loop": the vast majority of steel recycling involves melting scrap to produce new steels without changes in the inherent properties of the steel.
• That the quality of steel manufactured by the blast furnace + LD converter route and by the electric arc furnace route is equivalent.
• That the use of secondary material replaces the use of virgin material (primary): scrap collection and recycling in a secondary steel manufacturing process (electric arc furnace route) avoids primary steel production (blast furnace route + LD converter).

[2] World Steel Association Life Cycle Inventory Methodology Report 2017, Appendix 2: Recycling methodology description

7 - Environmental performance

SimaPro 9.1 was used for the Life Cycle Assessment study. Given that the difference between products in the potential environmental impact for the mandatory impact category Global Warming is lower than 5,5% concerning the sum of modules A1, A2 and A3, results are presented using the impacts of PGC 100 x 0,9 as representative product, considering that it is the product with the highest production and sales volume within the Steel Frame® product family.

7.1 - Environmental performance

Potential environmental impact indicators were calculated using the CML-IA Baseline V3.06 method, as implemented in SimaPro 9.1.

WE CHOOSE TO
RESPECT THE ENVIRONMENT

To believe that something is possible, is to make it true.

PRODUCT: PGC100x0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
impact category	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, reciclyng potential
Abiotic depletion	kg Sb eq	3,36	3,35E-04	0,18	0	0	0	0	0	0	0	1,18E-05	1,38E-04	0	2,87E-07	-2,36
Abiotic depletion (fossil fuels)	MJ	32.100,55	305,43	2.954,01	0	0	0	0	0	0	0	4,40E+01	126,07	0	8,48E-01	-26.385,63
Global warming (GWP100a)	kg CO_2 eq	3.003,94	19,90	264,38	0	0	0	0	0	0	0	3,15E+00	8,21	0	1,25E-01	-2.589,57
Ozone layer depletion (ODP)	kg CFC-11 eq	1,85E-04	3,66E-06	1,67E-05	0	0	0	0	0	0	0	3,09E-07	1,51E-06	0	9,94E-09	-1,43E-04
Photochemical oxidation	kg C_2H_4 eq	1,69	2,99E-03	0,13	0	0	0	0	0	0	0	5,31E-04	1,24E-03	0	2,96E-05	-1,56
Acidification	kg SO_2 eq	24,08	0,10	1,62	0	0	0	0	0	0	0	1,26E-02	0,04	0	2,28E-04	-18,97
Eutrophication	kg PO_4^3 eq	10,20	0,02	0,69	0	0	0	0	0	0	0	1,48E-03	1,02E-02	0	4,39E-04	-8,86

Table 7 – Potential environmental impact per metric ton of product

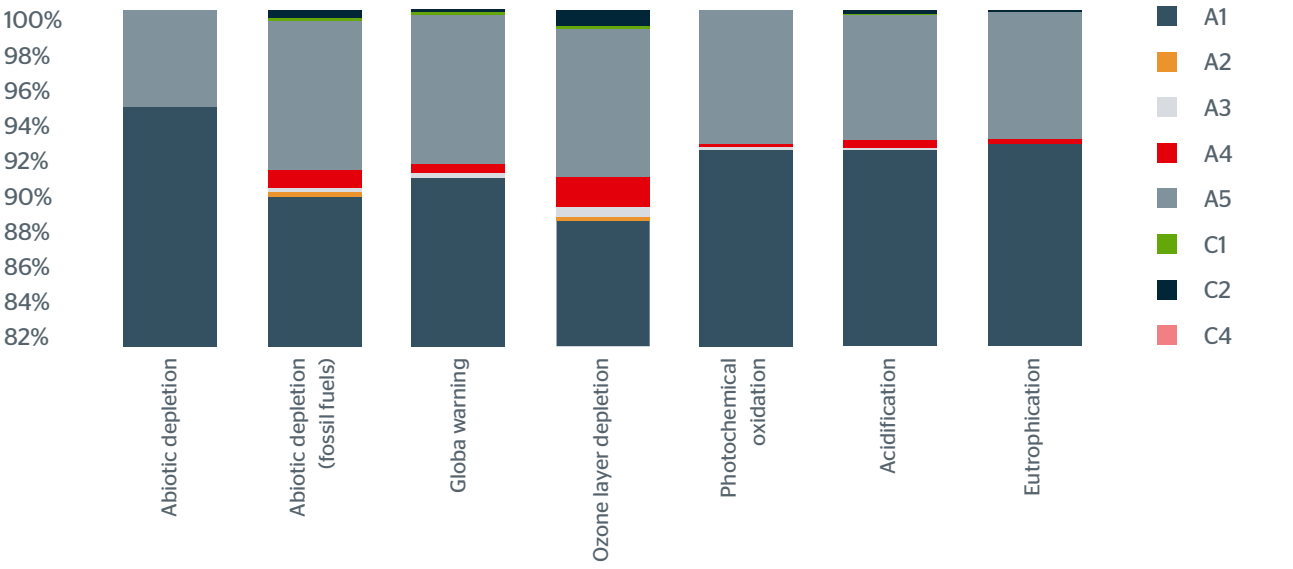


Figure 3 – Potential environmental impact contribution of each module, per metric ton of product. Module D not included.

7.2 - Resource use

Parameters describing resource use per ton of product were calculated using the Cumulative Energy Demand (LHV) V1.00 method, as implemented in SimaPro 9.1, except for the parameter of use of net fresh water that was calculated using ReCiPe 2016 Midpoint (H) V1.04 method, as implemented in SimaPro 9.1.

PRODUCT: PGC100x0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
parametre	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, recycling potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	3.417,95	3,29	321,88	0	0	0	0	0	0	0	10,45	1,36	0	9,26E-04	-2.743,87
Use of renewable primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.417,95	3,29	321,88	0	0	0	0	0	0	0	10,45	1,36	0	0,01	-2.743,87
Use of non-renewable primary energy excluding non- renewable primary energy resources used as raw materials	MJ	2.212,62	309,74	420,23	0	0	0	0	0	0	0	51,09	127,84	0	0,86	-1.273,46
Use of non-renewable primary energy resources used as raw materials	MJ	31.786,59	0	2.723,09	0	0	0	0	0	0	0	0	0	0	0	-26.426,93
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	33.999,21	309,74	3.143,32	0	0	0	0	0	0	0	51,09	127,84	0	0,86	-27.700,39
Use of secondary material	kg	125,01	0	16,61	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water	m^3	36,43	0,04	3,92	0	0	0	0	0	0	0	0	0,02	0	9,26E-04	-24,56

Table 8 – Resource use indicators per metric ton of product

7.3 - Waste categories

Parameters describing waste categories were calculated using the EDIP 2003 V1.07 method, as implemented in SimaPro 9.1.
It is worth highlighting that no radioactive waste is produced in AD Barbieri SA's operations, and that the results obtained in this category stem from processes developed through Ecoinvent 3.6 database..

PRODUCT: PGC100x0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
parameter	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D Reuse, recovery, recycling potential
Hazardous disposed waste	kg	0,62	7,59E-04	0,04	0	0	0	0	0	0	0	4,09E-05	3,13E-04	0	1,39E-04	-0,48
Non-hazardous disposed waste	kg	1.123,81	26,21	138,60	0	0	0	0	0	0	0	1,50E-01	10,82	0	5,65	-101,97
Radioactive disposed waste	kg	0,08	2,06E-03	0,01	0	0	0	0	0	0	0	3,03E-04	8,50E-04	0	5,61E-06	-0,05

Table 9 – Waste categories indicators per metric ton of product

7.4 - Other output flows

Parameters describing other output flows were calculated using the Life Cycle Inventory and using data of energy power generation during the incineration of waste, which is detailed in the process description of the Ecoinvent 3.6 datasets.

PRODUCT: PGC100x0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
parameter	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D Reuse, recovery, recycling potential
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	700,00	0	0	0	0
Materials for recycling	kg	1,86	0	0,12	0	0	0	0	0	0	0	343,53	0	0	0	0
Materials fo power recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy	MJ	45,68	0	22,40	0	0	0	0	0	0	0	0	0	0	0	0

Table 10 – Other output flows indicators per metric ton of product

7.5 - Interpretation

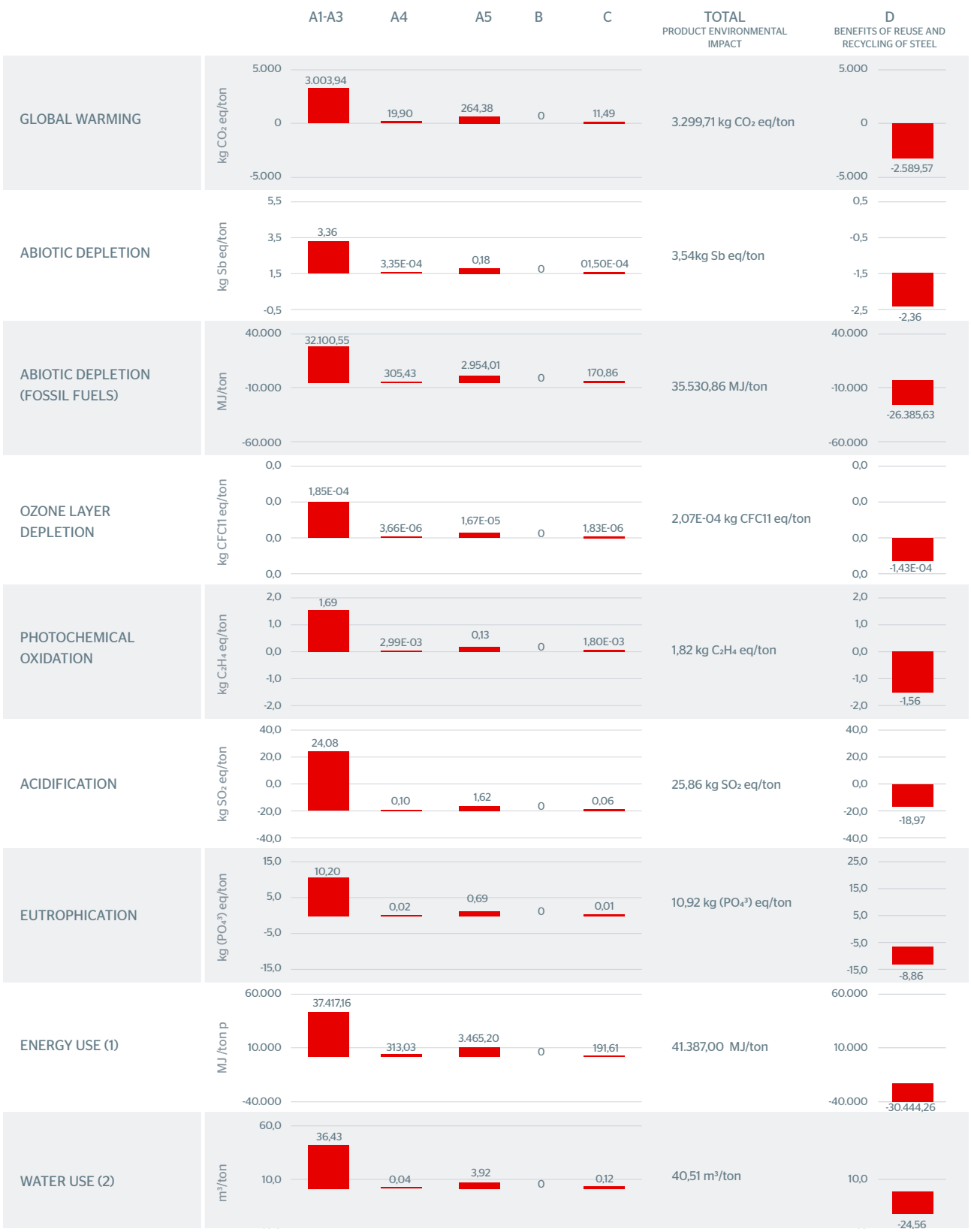


Figure 4 – Interpretation of environmental impact indicators for 1 metric ton of product.
(1) Corresponds to total use of primary power. (2) Belongs to use of net fresh water.

Potential environmental impact

Module A1 is the one with the greatest potential environmental impact in all impact categories: as a minimum, it contributes to generate 86% of the potential environmental impact in all impact categories. Within module A1, the process responsible for the greatest part of environmental impact is steel production, done via de BF-BOPF route.
The module with the second largest potential environmental impact is module A5, and this is because this module includes the additional production of galvanized steel due to the generation of steel profiles waste during construction installation, and due to the production of steel accessories (whose raw material is manufactured through various production routes) used during construction installation.
Therefore, **steel production is the process with the highest potential environmental impact in all impact categories.**

Resource use

When analyzing the indicators of total use of primary power resources and use of net fresh water, it can be concluded that, once again, module A1 is the module that contributes the most to the resource use. Within module A1, steel production process is the process that generates the highest resource use.

If you are looking for different results,
do not always do the same.

WE CHOOSE TO
EVOLVE

7.6 -Additional environmental information

BARBIERI HAS THE FOLLOWING CERTIFICATION

ISO 14001:2015: Production and Sale of Drywall Profiles, Steel Frame and Steel Shape and its appliances, Production of Perfilplas ceilings and coatings, Regular Perfilplas PVC Curtains, Adjustables Perfilplas PVC Curtains, Ironworks, and automation for Roll Up Curtains. [1]

ISO 9001:2015: Production and Sale of Drywall Profiles, Steel Frame and Steel Shape and appliances. [2]

Environmental management policy

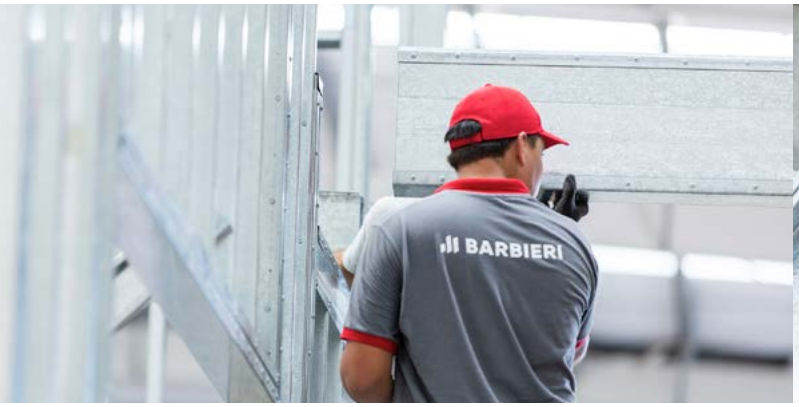
Barbieri is committed to the world's harmonic and sustainable development, actively protecting the environment. This way, to meet this environmental commitment with the planet's care as a priority, our company defines its actions with the following guidelines:
- To avoid pollution by encouraging as little use as possible of natural resources, avoiding their deterioration and contamination.
- To constantly improve our company's processes and products with the goal of creating a better future.
- To educate our community and to foster and communicate this policy and actions arising from them to contribute to developing a cooperative, committed, equal society living in balance with nature

Occupational safety and health management policy

Barbieri understands that its contributors' safety and health is a priority. Therefore, to meet this goal our company's actions are focused on:
- Promoting learning and security spaces for all individuals to feel as fulfilled, safe, and key members of the company.
- Demonstrating that the company's daily actions and decisions are guided by the company's values: commitment, passion, integration, honesty, and sustainability.

Innovation policy

Barbieri seeks to maximize a high triple-impact goal using the market's strength as a way to grow.
The innovation approach is open, focused on developing a culture leaned to a shared vision with innovation skills for businesses, processes, solutions, and services.



8 - Verification and registrarion

Programme	EI Sistema Internacional EPD® www.environdec.com	EPD®
Programme operator	EPD International AB / Box 210 60 / SE-100 31 Stockholm, Sweden	
EPD – Registration number	S-P-05012	
EPD – Issue date	30/10/2021	
EPD – Validity date	29/10/2026	
Identification of PCR	2012:01 Construction products and construction services Version 2.31	
PCR review was conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via: info@environdec.com	
Independent verification of the declaration and data, according to ISO 14025	EPD Process Certification (internal) EPD Verification (external)	☐ ☑
Third-party verifier **Approved by**	Bárbara Civit - barbaracivit@gmail.com The International EPD® System	

9 - Contact information

EPD Owner

BARBIERI

A.D. Barbieri S.A.
A.D. Barbieri (ex Luis María Drago) 1382, Almirante Brown,
Provincia de Buenos Aires, Argentina.
adbarbieri.com

Contact: Juan Francisco Barbieri - juanfrancisco@adbarbieri.com.ar

LCA Author

IMPAQTING

IMPAQTING
www.impaqting.com

Contact: Luciana Saporiti - luciana.saporiti@impaqting.com

Programme operator

EPD®

EPD International AB
BOX 210 60, SE-100 31 Estocolmo, Suecia
www.environdec.com

Contact: info@environdec.com

10 - Bibliography

- UN Central Product Classification (CPC)
https://unstats.un.org/unsd/classifications/unsdclassifications/cpcv21.pdf

- ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.

- ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.

- ISO 14025:2006: Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures.

- PCR 2012:01 Construction products and construction services Version 2.31

- EN 15804:2012+A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

- General Programme instructions of the International EPD® System, Version 2.5.

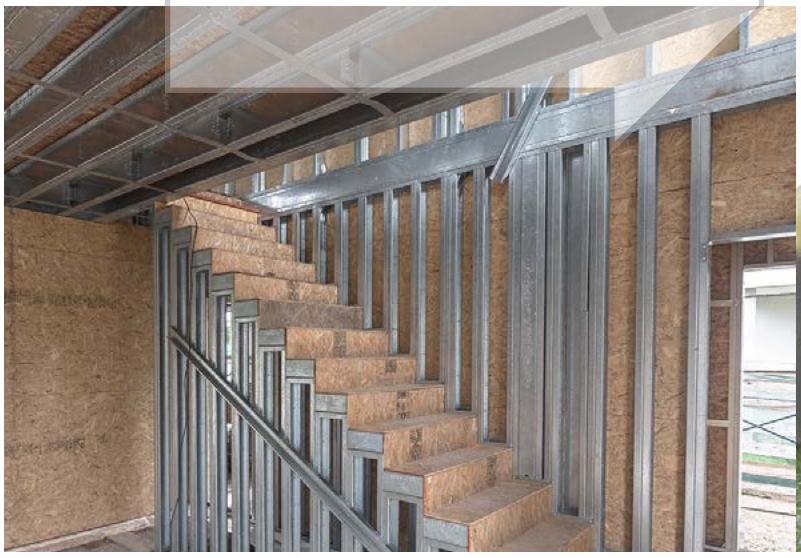
- LCA report "Análisis de Ciclo de Vida para productos seleccionados de la familia Steel Frame®"

- World Steel Association 2017: Life cycle inventory methodology report.

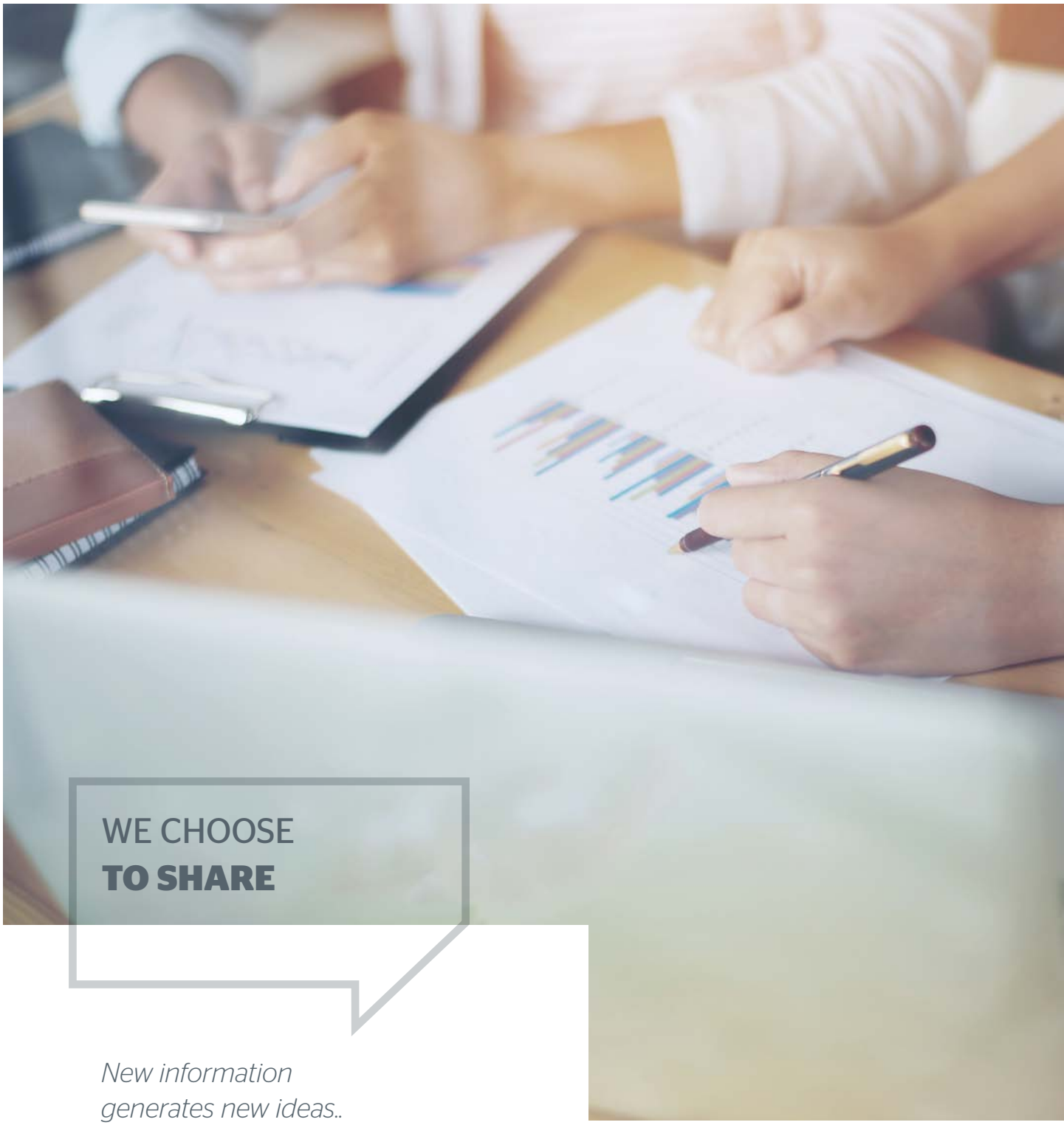
- C. Leroy, J-S. Thomas, N. Avery, J. Bollen, L. Tikana: Tackling recycling aspects in EN15804

WE CHOOSE
TO COMMIT

We strive to contribute for our purpose.



ZOOMED TABLES



6.2 - Límites del sistema

LIFE CYCLE ENVIRONMENTAL INFORMATION OF GALVANIZED STEEL PROFILES																OTRA INFORMACIÓN AMBIENTAL
A1 - A3			A4 - A5		B1 - B7							C1 - C4				D
Product stage			Construction process satge		Use stage							End of life stage				Resource recovery stage
raw materiales	transport	manufacturing	transport	construction installation	use	maintenance	repair	replacement	refurbishment	operational energy use	operational water use	deconstruction, demolition	transport	waste processing	disposal	reuse, recovery, reciclyng potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3 – System boundary. X = included in the LCA

BACK

7.1 - Environmental performance

PRODUCT: PGC100X0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
impacto category	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, recycling potential
Abiotic depletion	kg Sb eq	3,36	3,35E-04	0,18	0	0	0	0	0	0	0	1,18E-05	1,38E-04	0	2,87E-07	-2,36
Abiotic depletion (fossil fuels)	MJ	32.100,55	305,43	2.954,01	0	0	0	0	0	0	0	4,40E+01	126,07	0	8,48E-01	-26.385,63
Global warming (GWP100a)	kg CO_2 eq	3.003,94	19,90	264,38	0	0	0	0	0	0	0	3,15E+00	8,21	0	1,25E-01	-2.589,57
Ozone layer depletion (ODP)	kg CFC-11 eq	1,85E-04	3,66E-06	1,67E-05	0	0	0	0	0	0	0	3,09E-07	1,51E-06	0	9,94E-09	-1,43E-04
Photochemical oxidation	kg C_2H_4 eq	1,69	2,99E-03	0,13	0	0	0	0	0	0	0	5,31E-04	1,24E-03	0	2,96E-05	-1,56
Acidification	kg SO_2 eq	24,08	0,10	1,62	0	0	0	0	0	0	0	1,26E-02	0,04	0	2,28E-04	-18,97
Eutrophication	kg PO_4^3 eq	10,20	0,02	0,69	0	0	0	0	0	0	0	1,48E-03	1,02E-02	0	4,39E-04	-8,86

Table 7 – Potential environmental impact per metric ton of product

BACK

7.2 - Resource use

PRODUCT: PGC100X0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
impacto category	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, recycling potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	3.417,95	3,29	321,88	0	0	0	0	0	0	0	10,45	1,36	0	9,26E-04	-2.743,87
Use of renewable primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.417,95	3,29	321,88	0	0	0	0	0	0	0	10,45	1,36	0	0,01	-2.743,87
Use of non-renewable primary energy excluding non-renewable primary energy resources usedas raw materials	MJ	2.212,62	309,74	420,23	0	0	0	0	0	0	0	51,09	127,84	0	0,86	-1.273,46
Use of non-renewable primary energy resources used as raw materials	MJ	31.786,59	0	2.723,09	0	0	0	0	0	0	0	0	0	0	0	-26.426,93
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	33.999,21	309,74	3.143,32	0	0	0	0	0	0	0	51,09	127,84	0	0,86	-27.700,39
Use of secondary material	kg	125,01	0	16,61	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water	m^3	36,43	0,04	3,92	0	0	0	0	0	0	0	0	0,02	0	9,26E-04	-24,56

Tabla 8 - Indicadores de uso de recursos de 1 tonelada de producto

BACK

7.3 - Waste categories

PRODUCT: PGC100X0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
parametre	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, recycling potential
Hazardous disposed waste	kg	0,62	7,59E-04	0,04	0	0	0	0	0	0	0	4,09E-05	3,13E-04	0	1,39E-04	-0,48
Non-hazardous disposed waste	kg	1.123,81	26,21	138,60	0	0	0	0	0	0	0	1,50E-01	10,82	0	5,65	-101,97
Radioactive disposed waste	kg	0,08	2,06E-03	0,01	0	0	0	0	0	0	0	3,03E-04	8,50E-04	0	5,61E-06	-0,05

Table 9 – Waste categories indicators per metric ton of product

BACK

7.4 - Other output flows

PRODUCT: PGC100X0,9		PRODUCT STAGE	CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				
parametre	unit	A1 - A2 - A3	A4 transport	A5 installation	B1 use	B2 maintenance	B3 repair	B4 replacement	B5 refurbishment	B6 operational energy use	B7 operational water use	C1 de-construction, demolition	C2 transport	C3 waste processing	C4 disposal	D reuse, recovery, recycling potential
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	700,00	0	0	0	0
Materials for recycling	kg	1,86	0	0,12	0	0	0	0	0	0	0	343,53	0	0	0	0
Materials for power recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy	MJ	45,68	0	22,40	0	0	0	0	0	0	0	0	0	0	0	0

Table 10 – Other output flows indicators per metric ton of product

BACK

BARBIERI

AD Barbieri 1382 (Ex Luis M. Drago) · B1852LGP
Parque Ind. Almirante Brown
Burzaco · Buenos Aires · Argentina
Tel: (5411) 4136-4000

industrias@adbarbieri.com
adbarbieri.com